

CRITICAL RESEARCH NOTE

Faith Missions and Church Redevelopment in Ottawa, Ontario

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Abstract

In certain Christian denominations in North America, as church officials cope with shrinking and aging congregations, opportunities to repurpose church properties have come to the fore. Understood within an urban planning context, churches provide solutions to challenges faced by municipal sustainability planners, infill developers, and social housing providers. The following commentary focuses on Anglican and United Church activists in Ottawa, Ontario and their accomplishments in drawing attention to the possibilities for simultaneously rejuvenating churches, congregations and neighbourhoods. This paper spotlights an emerging social phenomenon: faith-based redevelopment of urban church properties, a topic not yet fully explored in the academic literature.

Keywords: faith-based redevelopment, urban sustainability

Résumé

Dans certaines confessions chrétiennes en Amérique du Nord, comme responsables de l'église face à la diminution et le vieillissement des congrégations, les possibilités de réutiliser les propriétés de l'église ont pris de l'importance. Compris dans un contexte de planification urbaine, les églises offrent des solutions aux défis auxquels font face les planificateurs municipaux de développement durable, les développeurs de remplissage, et les fournisseurs de logements sociaux. Le commentaire qui suit met l'accent sur les réalisations des activistes de l'Église Anglicane et Unie à Ottawa, en attirant l'attention aux possibilités de simultanément rajeunir les églises, les congrégations et les quartiers. Cet article met en lumière un phénomène social émergent: réaménagement basé sur la foi de propriétés de l'église urbaines, un sujet qui n'est pas encore totalement exploré dans la littérature académique.

Mots-clés : réaménagement basée sur la foi, durabilité urbaine

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1. Introduction

As urban populations in Canada grow, city planners and administrators increasingly favour intensifying housing, jobs and retail in already built-out areas. Unlike new development on the outskirts of cities, such “infill” developments save money by using existing city services such as fire, police, transit, sewers and water more efficiently. This critical research note explores opportunities for repurposed Christian churches to make both congregations and cities more sustainable. Over recent decades, various congregations have struggled with shrinking attendance and donations on the one hand, and increasing operating costs from aging buildings on the other. The research note draws on a number of sources including urban planning policy documents, an environmental scan of faith-based redevelopments in Ottawa, participant observation in the Mission Building Forum (including various facilitated discussion groups) in Ottawa in October of 2013, and ongoing involvement in the Multifaith Housing Initiative in Ottawa, Canada.

This commentary starts with an overview of the urban planning context into which the redevelopment of religious properties fits. It then focuses on specific churches in Ottawa as examples of changing church demographics and missions. Finally, it introduces two activist parishioners who use faith missions to guide church property renewal. Two Ottawa churches, one Anglican and one United, provide brief case studies. This research note documents an emerging social phenomenon, and reveals that despite significant challenges, church properties can be adapted to suit both church missions and urban sustainability goals.

2. Church Redevelopment and the Urban Planning Context in Ottawa

The City of Ottawa Official Plan encourages densification (more housing and jobs per km²) and intensification (more mixed retail/housing/services per km²) in both urban and suburban neighbourhoods (City of Ottawa 2003). Dense, mixed-use development cuts infrastructure costs, energy consumption and carbon production by using municipal services more efficiently and reducing reliance on automobiles (Blais 2010; EPA 2011; Government of Ontario 2005; Miller 2007). Densification and intensification are often called “infill” development (MAH 2009).

However, density goals in Ottawa’s Official Plan remain guidelines rather than legal requirements. The public scrutinizes infill development with suspicion, and zoning for infill development remains constantly in flux (Miguel 2011). Neighbourhoods, the City and Ottawa’s development industry all struggle with the complex mix of infill regulations and guidelines (City of Ottawa 2014; GOHBA 2011; Herbert 2010; Pearson 2014, 2015; Tandon 2011). Rules and guidelines are often challenged by both developers and neighboring land owners: the former wish to increase densities to generate profit, and the latter are most concerned about traffic congestion and impacts on property values (see for example Mueller 2011). One senior City policymaker stated that the contests reflect “the collision of public and private interests” in city planning—a contest that often pitches sustainable urbanism against the building industry (cited in Martin 2013). Such contests can be expected to escalate with rising energy costs and environmental concerns as consumers and municipal planners alike compare urban versus suburban housing options.

Ottawa’s pressing need for affordable housing lends urgency to the issue of urban sustainability¹. In 2014, the City of Ottawa publicized a 10-year initiative to end homelessness. However, suitable, well-located development property is increasingly scarce and expensive, which privileges well-capitalized infill developers over affordable and social housing providers. Since the 1980s and throughout the current global recession, Canada’s shrinking welfare state apparatus has “...devolved much social policy, including social housing, and retrenched” (Sutor 2011). The task of housing people who cannot afford to buy houses can only grow more pressing.

The redevelopment or adaptive reuse of church properties may offer simultaneous solutions for urban neighborhoods, affordable housing providers and cash-strapped church congregations (Sherlock 2013; Welch 2012). Many urban churches in prime Ottawa locations are in decline and thus represent potential for sustainable solutions to multiple challenges. The theological foundation of their missions make it undesirable for church congregations to sell their buildings outright to real estate developers because missions have historically revolved around spiritual guidance, social justice and ministering to the less fortunate—tasks that grow increasingly difficult as church incomes shrink (Mian 2008). But the case studies in this paper suggest that missions also offer clues about how churches might be re-purposed to attract neighborhoods back into the buildings. The faith missions associated with our case studies are briefly described in Section 3.

3. Faith Missions and Repurposing of Church Properties

As mentioned, many Christian congregations in North America are shrinking (Clark and MacDonald 2011; Pew Research Centre 2013 & 2015). Increasingly, remaining members cannot afford to maintain their buildings, yet they still wish to fulfill social and sustainability policies such as those in the following Anglican and United Church missions.

Anglican Church of Canada

Social equity and justice are firmly ensconced in the Anglican Church's mission:

The Anglican Church of Canada has been committed to working in partnerships in social justice and human rights for many years. We strive...to give moral and ethical leadership in a world where the gaps between rich and poor widen every day, where the Earth is groaning under the weight of human abuse, and where violence is physical and systemic (ACC 2014b).

As with environmental activism, Anglicans are active in numerous faith-based social justice initiatives. The social justice elements of the Anglican Church mission find expression in numerous social services in Ottawa, including a child poverty initiative, a food bank, supports for homeless people, a women's shelter, crisis support for youth, and supports and sponsorship for refugees.

On the environmental front, the Anglican Church of Canada's (ACC) website posits: "Canadian Anglicans are conserving and improving the natural environment... to safeguard the integrity of creation and sustain and renew the life of the earth" (ACC 2014a). This website includes directions on how to make a church building more ecologically benign, and links to the Anglican Church's *Public Witness for Social and Ecological Justice*. In addition, Anglican Primate Archbishop Hiltz "...identifies climate change as a moral and spiritual challenge that demands a response from Canadian Anglicans." The statement refers to number five of the Anglican Five Marks of Mission: "To strive to safeguard the integrity of creation and sustain and renew the life of the earth" (ACC 2014c). The Anglican Church has also co-authored *The Canadian Interfaith Call for Leadership and Action on Climate Change*. Further, the Anglican Church of Canada supports an interfaith program called *Faith and the Common Good*, whose members "...share a calling to protect our ecosystem and a passion for community service." The national Anglican Church environmental initiative is Creation Matters, which is the Canadian part of the global Anglican Communion Environmental Network (ACEN).

Faith and the Common Good network has created a program called "Mission per Square Foot" which is tasked with making church spaces not only more appealing to the community, but also more environmentally sustainable. The church partners with other faith groups in these endeavors through the Anglican Communion Environmental Network. In these organizational initiatives and online documents, social and environmental sustainability are woven together with the Anglicans' broader mission.

United Church of Canada

As with the Anglican Church, the United Church's social justice focus is carefully and extensively defined in online documents about food security, energy use, gambling, global inequality, corporate social responsibility, poverty and housing. The United Church implements its mission in their provision of youth and adult drop-in centres, space for Alcoholics Anonymous, a laundry co-operative for low-income households, food banks, affordable housing initiatives and supports for community health centres.

The United Church of Canada (UCC) also incorporates environmental and social justice elements into its mission. To wit:

...the United Church believes that 'each part of creation reveals unique aspects of God the Creator' (A Song of Faith) and therefore has intrinsic value. We are also concerned that climate change, ocean change, lack of access to clean water, and resource extraction have a greater impact on the most impoverished and vulnerable living beings (UCC 2014).

Missions and Declining Members

For both United and Anglican Churches, broad missions, operating costs and declining revenues are forcing difficult decisions. Numerous church properties have been sold in whole or in part to service deferred maintenance liabilities—often to the chagrin of surviving parishioners.

Such difficult decisions have been resolved in creative ways by some urban church communities. Numerous Christian churches in Ottawa have amalgamated to cut expenses. For example, Kingsway, Northwestern and Westboro United Churches amalgamated into Kitchissippi United Church in 2008. Northwestern United was sold for office space and parking for an adjacent mosque. The group then sold Westboro United, but not to the highest bidder who would have built to the maximum allowable height and density. Instead, the group chose a developer with a moderate vision for densification and dedicated community space on the property. The site has since been developed into low-rise townhouses leaving the church intact, but repurposing it for offices for Bluesfest, a local festival organizer, and the Bluesfest School of Music and Art. In the process, Westboro United fulfilled at least part of their spiritual mission by preserving the church building and negotiating community space within, and by controlling development of environmentally and socially responsible housing. The school ensures that the church space is re-invigorated for the surrounding community (Grace, 2014). Kingsway United was then renamed Kitchissippi United, and church functions from Westboro and Northwestern United were merged in that location.

Another response to declining congregations has been careful diversification of space in churches to better reflect parishioners' and community needs. For example, St. Luke's Anglican Church in Ottawa has undergone significant renovations over the past 20 years: the church hall was demolished to build 44 rent-geared-to-income apartment units; the structure now houses offices for non-profits; the upgraded basement provides meeting space and a commercial kitchen that feeds hundreds of low-income people per day; and the smaller chapel space includes movable chairs rather than pews to facilitate multiple uses. In addition, renovators improved the water, heating and cooling systems, investments that will significantly reduce operating costs. The upgrades were guided by Greening Sacred Spaces, a faith-based green building initiative, and the St. Luke's adaptive renovation serves as a model for other declining urban churches (see Part 4 for more links to innovative rejuvenation projects).

Although some Canadian researchers have examined secular redevelopment of church properties (Amayu 2014; Hackworth & Gullikson 2013; Lynch 2013; Mian 2008), we are aware of no scholarly research on urban development tied to church missions. It appears that church decisions to sell property are influenced by a variable mix of anxiety, denial, limited awareness of options and absence of real estate development capacity. However, two Ottawa activists are at the forefront of discussion about options for churches, church missions, and sustainability. The next section describes those activists, the *Mission Building Forum*, its lead-up and its aftermath.

4. The *Mission Building Forum*

Two of the key proponents of church and mission rejuvenation in Ottawa are Randal Goodfellow, who guided the St. Luke's Anglican transformation, and Chris Henderson, who negotiated the Kitchissippi United amalgamation. In addition to their religious affiliations, both men engage substantively in sustainability circles in the region: Goodfellow as consultant in clean technology and Director of Greening Sacred Spaces; and Henderson as a clean energy advisor to Aboriginal communities across Canada through his company Lumos Energy (see also www.aboriginalpower.ca). Henderson also founded the Delphi Group, a prominent Canadian corporate sustainability consultancy, and contributes significant volunteer efforts to homelessness activism in Ottawa.

Henderson and Goodfellow sought to share lessons from their church rejuvenation projects. In early 2013, they began meeting to discuss church properties and faith missions. However, the challenge was not simply to liquidate or re-invent real estate. Rather, Goodfellow and Henderson wanted to begin broader discussions about how churches could continue to fulfill long-standing community service missions.

Although cash-strapped and in need of upkeep, many church properties include additional land, and most are mortgage-free. Moreover, certain urban parishes remain relatively prosperous and possess land and financial resources that could be leveraged for worthy, mission-based causes. Within the broader discussion, real estate, building conditions and housing soon came to dominate discussions. Spurred in part by lost opportunity, in

part by need, and in part by a clear recognition that in a prolonged economic downturn, providers needed new resources to generate affordable housing, the *Mission Building* movement gathered momentum.

On October 26, 2013, the *Mission Building* group held a well-attended one-day forum called “Regenerating Faith Properties for Faith Missions” at St. Paul University in Old Ottawa East.² In their opening remarks, Henderson characterized faith properties as “a Gift from the Creator” and detailed an ambitious vision: “If we connect faith properties in a way that appeals to communities, we re-build faith congregations.” Goodfellow asserted a similarly fervent belief: “We are baptized to protect the environment.” And panelist Monica Patten, past President and CEO of Community Foundations of Canada, remarked: “many people involved in NGOs are also people of faith” and ultimately posited a vision that was “collaborative, restorative, and deeply faithful.”

Conference organizers brought together panelists who highlighted several innovative church redevelopment projects, including: St. Brigid’s Centre for the Arts and Cathedral Hill in Ottawa; St. Gabriel’s in Toronto³; and the West End Commons in Winnipeg. Community organizations including Ottawa Centre Eco-District, Ecology Ottawa, Ottawa Innercity Ministries, the Ottawa Renewable Energy Co-op and Multifaith Housing Initiative spoke to their needs and visions for church properties. The conference concluded with a series of facilitated discussion groups:

- Managing the property sale and redevelopment process;
- Greening facilities;
- Partnering with community organizations;
- Partnering and financing for property regeneration; and,
- Constructive community engagement in the disposition and redevelopment of faith properties.

The event resulted in some cogent advice to prospective project proponents, including the need to: clarify and achieve consensus around the desired long-term vision; recognize the grieving process parishioners may feel as a property is either disposed of or repurposed; build partnerships to steward a project through to completion; seek out the expertise of planners, architects, and lawyers; and, communicate iteratively and actively with the adjacent community throughout the process.

5. After the *Mission Building* Forum

Henderson and Goodfellow organized further meetings to maintain momentum. In early December of 2013, Henderson hosted a meeting at Kitchissippi United to garner feedback from the Forum, to identify faith and community group priorities and to chart further actions. Early in 2014, Goodfellow and Henderson organized another meeting in concert with non-profit housing provider Centretown Citizens Ottawa Corporation that focused solely on church resources and housing homeless and low-income people. In May of 2014, Henderson sent out an invitation to participate in a revised initiative called ‘Broadening the Base’ in which faith groups are no longer the principle actors:

The essential effort is to catalyze a broad community-based goal of having a concrete impact on affordable housing... Faith communities would be an important part of this effort. There will also be monthly Ideas and Innovation Forums on facets of the subject (Land assembly, REIT’s, Trust, Philanthropy, etc.). These shall be open sessions and information about them will be circulated also (Henderson 2014).

As of November 2015, the two *Mission Building* organizers continue to explore possibilities for church properties. Led mainly by Henderson, faith properties have been woven into a larger, more ambitious plan with other affordable housing providers called Broadening the Base. Meanwhile, Goodfellow is exploring multiple options for churches across Canada as director of Mission per Square Foot, a national interfaith program working to repurpose and rejuvenate churches to “meet community needs in a sustainable manner.”

6. Conclusion

Environmental concerns and urban planning trends compel infill development in Canadian cities. As

demographic and planning trends draw housing development from the suburbs back into the urban core, underutilized church real estate will increasingly attract the attention of planners and social service activists and agencies. Infill developers, understandably, are also showing interest.

Synergies exist between proponents of Ottawa Christian faith missions and urban sustainability stakeholders. And the potential for churches to offer green affordable housing through property redevelopment as they continue to provide community services for marginalized populations remains largely unexplored.

Innovative examples such as St. Luke's, and the seeds planted by Henderson and Goodfellow in their *Mission Building* forum, are inspiring others to establish clear social and environmental priorities as they rejuvenate their buildings and missions. As discussions about finances become tenser, what are the possibilities and constraints for congregations to opt for long-term sustainable social redevelopment that furthers their broader spiritual missions? How might the City of Ottawa and churches work together to cushion the contest between public and private interests in this emergent social movement? Clearly, these questions will grow more pressing as both the City and churches adapt to changing social, environmental and economic priorities.

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Notes

¹ Sustainability must be for all, and not just for people who can afford to buy a house. According to the Alliance to End Homelessness (2014), there are approximately 10,200 households (not individuals) on the waiting list for social housing in Ottawa. The average wait time for subsidized housing is five years (ONPA, 2014).

² At the time Goodfellow was Chair of Creation Matters, board member of Faith and the Common Good and chair of the property committee of St. Luke's Anglican.

³ For another example of an innovative church property adaptive repurposing and redevelopment in Toronto, see <http://www.greenphoenix.ca/>.

References

- Alliance to End Homelessness. 2014. 2014 Progress Report on Ending Homelessness in Ottawa. Accessed November 21, 2015 at <http://endhomelessnessottawa.ca/2014-progress-report/>
- Amayu, E. 2014. *New Uses for Old Churches: An Examination of the Effects of Planning Regulations on the Adaptive Reuse of Church Buildings*. A report submitted to the Master of Urban and Regional Planning Program. Kingston: Queen's University. Accessed July 9, 2014 at: http://qspace.library.queensu.ca/bitstream/1974/12246/1/Amayu_Ermias_A_201406_MPL.pdf.
- Anglican Church of Canada (ACC). 2014a. *Mission and Justice Relationships: Creation Matters*. Accessed July 9, 2015 at: <http://www.anglican.ca/relationships/programs/creationmatters>.
- Anglican Church of Canada (ACC). 2014b. *Public Witness for Social and Ecological Justice*. Accessed July 9, 2015 at: <http://www.anglican.ca/relationships/programs/public-witness>.
- Anglican Church of Canada (ACC). 2014c. The Five Marks of Mission. Accessed July 9, 2015 at: <http://www.anglicancommunion.org/ministry/mission/fivemarks.cfm>.
- Blais, P. 2010. *Perverse cities: Hidden Subsidies, Wonky Policy, and Urban Sprawl*. Vancouver: UBC Press.
- City of Ottawa 2003. '2.1 The Challenge Ahead' in *Official Plan*. Accessed July 9, 2015 at: <http://ottawa.ca/en/official-plan/0/21-challenge-ahead>.
- City of Ottawa. 2014. City to make planning information and consultations clearer, more transparent. News Release, June 23. Accessed July 3, 2015 at: <http://ottawa.ca/en/news/city-make-planning-information-and-consultations-clearer-more-transparent>
- Clark, B. and S. MacDonald. 2011. 'How are Canada's five largest Protestant denominations faring? A look at the 2001 census' in *Studies in Religion-Sciences Religieuses*, 40 (4): 511-534.
- Cox, W. 2009. *Special Report: Infill in Urban Areas*. Newgeography. Accessed November 29, 2015 at <http://www.newgeography.com/content/00852-special-report-infill-us-urban-areas>
- Environmental Protection Agency (EPA). 2011. *Location efficiency and housing type – boiling it down to BTUs*.

- Jonathan Rose Company for United States EPA. Accessed July 9, 2015 at: http://www.epa.gov/smartgrowth/pdf/location_efficiency_BTU.pdf.
- Government of Ontario, Ontario Ministry of Municipal Affairs and Housing. 2005. *Places to Grow*. Land Use Planning and the Provincial Policy Statement. Accessed July 9, 2015 at <http://www.mah.gov.on.ca/Page1485.aspx>.
- Grace, A. 2014. New home for Bluesfest School of Music and Art. *Kitchissippi Times: The Spirit of Kitchissippi*. February 14. Accessed July 6, 2015 at: <http://kitchissippi.com/new-home-for-bluesfest-school-of-music-and-art/>.
- GOHBA. 2011. Greater Ottawa Home Builders' Association 'Sustainable Ottawa' column in Ottawa Citizen, Saturday November 19, 2011, p. I9.
- Hackworth, J. and E. Gullikson. 2013. Giving new meaning to religious conversion: Churches, redevelopment, and secularization in Toronto. *The Canadian Geographer*, 57:1, pp. 72-89.
- Henderson, C. 2014. Personal email communication.
- Herbert, J. 2010. 'Need exists to expand Ottawa's urban boundary' in Special to *Sun Media*. Accessed July 9, 2015 at: <http://www.ottawasun.com/newhomes/2010/04/16/13611971.html>.
- Lynch, N. 2014. Divine Living: Marketing and Selling Churches as Lofts in Toronto, Canada. *Housing, Theory and Society*. 31 (2): 1-21.
- MAH, 2009. *InfoSheet. Planning for Intensification*. Ontario Ministry of Municipal Affairs and Housing, Provincial Planning Policy Branch. Accessed November 29, 2015 at <http://www.mah.gov.on.ca/AssetFactory.aspx?did=7038>.
- Martin, G. 2013. *Manufacturing 'Home': Sustainability Discourses in Suburban Ottawa*. Unpublished Ph.D, Dissertation. Carleton University, Ottawa, Canada. Accessed July 9, 2015 at: <https://curve.carleton.ca/system/files/theses/30271.pdf>.
- Miller, D. 2007. *White paper: Climate change and the official plan review*. Accessed July 9, 2015 at: <http://climateottawa.ca/wp-content/uploads/2012/05/white-paper-Climate-Change-Official-Plan.pdf>.
- Mian, N. 2008. 'Prophets-for-Profits': Redevelopment and the Altering Urban Religious Landscape. *Urban Studies*. 45 (10): pp. 2143-2161.
- Migueluez, A. 2011. The infill wars: a case study from Old Ottawa South. *SpacingOttawa*. Accessed July 3, 2015 at: <http://spacing.ca/ottawa/2011/02/01/the-infill-wars-a-case-study-from-old-ottawa-south/>.
- Mueller, L. 2011. Groups bring convent fight to the OMB. *Ottawa Community News*. Accessed June 26, 2015 at: <http://www.ottawacommunitynews.com/news-story/3813671-groups-bring-convent-fight-to-the-omb/>.
- ONPA (2014). Ontario Nonprofit Housing Association. An affordable home for everyone in the City of Ottawa. Accessed November 21, 2015 at https://www.onpha.on.ca/onpha/Content/PolicyAndResearch/Waiting_Lists_Survey_2014/Resources/Housing_Summaries/Ottawa.pdf.
- Pearson, M. 2014. Infill guidelines get tentative approval. *Ottawa Citizen*. March 24. Accessed July 9, 2015 at: <http://www.ottawacitizen.com/Infill+guidelines+tentative+approval/9660668/story.html>.
- Pearson, m. 2015. Planning committee considers new infill rules. *Ottawa Citizen*. May 27. Accessed November 29, 2015 at <http://ottawacitizen.com/news/local-news/planning-committee-considers-new-infill-rules>.
- Pew Research Centre. 2015. *America's Changing Religious Landscape: Christians Decline Sharply as Share of Population; Unaffiliated and Other Faiths Continue to Grow*. Report from a large-scale, longitudinal demographic study. Accessed June 26, 2015 at: <http://www.pewforum.org/2015/05/12/americas-changing-religious-landscape/>.
- Pew Research Centre. 2013. *Canada's Changing Religious Landscape. Analysis of Canadian census and survey data 1971-2011*. Accessed June 26, 2015 at: <http://www.pewforum.org/2013/06/27/canadas-changing-religious-landscape/>.
- Sherlock, D. 2013. *Building from Faith: A Smart Practices Guide for Redeveloping Underutilized Church Land to Meet Community Needs*. Victoria: Community Social Planning Council.
- Suttor, G. 2011. Offset Mirrors: Institutional Paths in Canadian and Australian Social Housing. *International Journal of Housing Policy*, 11 (3): 255-283,
- Tandon, S. 2011. The evolution and contradiction of Ontario's land-use oversight mechanisms and their implications for urban sprawl. *CURE Policy Brief*. Carleton University: Centre for Urban Research. Accessed July 6, 2015 at: <http://carleton.ca/cure/wp-content/uploads/CURE-Policy-Brief-Number-2.pdf>.

- United Church of Canada (UCC). 2014. Policy statement on *Social Justice: Ecology*. Accessed July 9, 2015 at: <http://www.united-church.ca/ecology>
- Welch, B.J. 2012. A dual nature: the archdiocesan community development corporation. *Community Development*, 43 (4): October, pp. 451–463.